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SPECIFICATIONS

1. Title of the Invention

Method of Controlling Call Processing

2. Claims

A method of controlling call processing characterized by a (stack type?) program control method conversion system which is provided with a memory means which holds a schedule management database for terminal users, and an identification means which identifies call in dialling signals as dialling signals which are subject to schedule control, and wherein the said schedule management database is accessed in response to the call in dialling signal, and when an incoming call is directed to the schedule manager, the schedule management database is accessed, the present location of the user being called is searched for, and the call in signal is connected to that location.

3. Detailed Description of the Invention

Applicable area of industry

The present invention relates to a method of controlling call processing in electronic switching devices, and more particularly to a method which is capable of improving the level of service to the subscriber when the subscriber being called is absent to the destination according to the time and by determining the terminal to be called according to the subscriber's schedule.

Prior art and deficiencies thereof

In general in electronic exchanges, when the telephone number of a called party is input from a subscriber telephone handset, the exchange immediately sends a signal and makes a connection. In such cases, if the called party is absent or has moved, an absent redirection service is registered, and the fact that the called party is registered for the absent redirection service is stored in the subscriber action region or the service registration area of the main memory device. The control device in the electronic exchange references the aforementioned area when it determines the called party during call processing, and if a redirect number is recorded, the electronic exchange provides a (transfer?) service to that redirect number.

However, with such types of absent redirection service, only one redirect number is specified for when the subscriber is absent, and hence if at different times subscriber's location changes, the registration of the absent redirect number must be deleted, and the new number must be registered. Thus this method suffers the deficiency of being very inconvenient if the subscriber moves continuously between a plurality of locations.

Objectives of the invention

It is an objective of the present invention to enable time management of telephone calls for each subscriber according to the subscriber's time schedule, and to provide a call processing control method which allows the redirection of incoming calls to the subscriber's location according to the subscriber's time schedule.

Constitution

In order to achieve such objectives, the present invention provides a method of controlling call processing characterized by a (stack type?) program control method conversion system which is provided with a memory means which holds a schedule management database for terminal users, and an identification means which identifies call in dialling signals as dialling signals which are subject to schedule control, and wherein the said schedule management database is accessed in response to the call in dialling signal, and when an incoming call is directed to the schedule manager, the schedule management database is accessed, the present location of the user being called is searched for, and the call in signal is connected to that location.

Practical Embodiment

The following is a more detailed description of the present invention by means of a practical embodiment thereof.

Under the present invention, the exchange is provided with a subscriber schedule management database. A subscriber whose locations change according to the time of day and who wishes incoming calls to be redirected to such new locations, registers the times and new locations in the schedule management database. In this manner, when the call processing program determines the (receiving?) terminal, the call processing program references the schedule management database, and by determining the receiving terminal, determines the destination for the incoming call according to the subscriber's schedule.

The present invention employs three dialling methods in order to implement this: ① dial signal similar to that of the prior art, ② (code?) + dial signal, and ③ name dialling, whereby the name of the called party is entered by alphabetic key. Naturally, an alphabetic key pad must be

provided in addition to the ten key pad on the telephone handset, in order to permit the aforementioned method ③ to be employed.

Moreover, the present invention provides a common database as illustrated in Figure 1 in which are recorded the name and individual number, the terminal number (telephone number), and the location at which such telephone is situated. Then, a schedule management table is provided in which the individual code of the subscriber who wishes his schedule to be registered, and a schedule pointer which indicates the location of the schedule, are recorded, while the times and locations for the individual are recorded in the schedule pointer portion. For example, it may be recorded that individual O is at location γ at time t_1 . In this case, when a telephone call is received for individual O, the system reads off the location of the schedule from the schedule management table, and for example because the schedule shows that individual O is at location γ between times t_1 and t_2 (or alternatively that telephone calls for individual O are to be directed to a telephone terminal at location γ), the aforementioned telephone call to individual O is redirected to terminal number Z, which is situated at location γ . The methods of dialling to such individual address may be by method ② by code + dialling number, or by method ③ by name dialling by input from an alphabetic keyboard.

In the case of method ②, if for example '80' is entered as the code number, the terminal number, that is to say the telephone number, may be entered following the code number. In this case, the dialling number = individual number, and therefore the dialling number that is entered following the code number causes the system to directly access the schedule management table and determine whether or not a schedule is registered.

In the case of method ③, the common database is accessed through name dialling, that is the name, and the individual number is found. The individual number is used to access the schedule management table, and then to determine whether or not a schedule is registered, and hence, if a schedule is registered, the schedule pointer is used to retrieve the location to which the call should be redirected, employing the time of day as the key.

In this manner, under the present invention, a station-to-station connection is established by method ①, and a person-to-person connection is established by method ②.

The following is a description of a practical embodiment of the present invention, by means of reference to Figures 2 to 6, and where necessary, by means of reference to Figure 1.

Figure 2 is a system outline plan of the present invention; Figure 3 is a detailed plan of the central control unit thereof; Figure 4 is a detailed plan of the communication service database

unit thereof; Figure 5 is an explanatory diagram of the operation of the present invention, and Figure 6 is an explanatory diagram of the individual schedule management service.

In the diagrams, 1-0 to 1-n are telephones, 2 is an exchange network, 3-0 to 3-n are trunk lines, 4 is the central control device, 5 is the main memory, and 6 is the common database.

As Figure 3 shows, the central control device 4 includes the main control unit 4-1, the service module 4-2, and the operation control management unit 4-3, and so forth.

The main control unit 4-1 includes the communication service database management unit 4A which is characteristic of the present invention and which will be described subsequently, the basic call processing unit 4B which performs basic call processing, the service management unit 4C which performs service management, and the call management unit 4D which manages calls, and so forth.

The operation control management unit 4-3 provides services on the basis of information for individual terminal users, and hence as shown in Figure 4, includes the name dialling identification circuit 43-1, the code number identification circuit 43-2, and the schedule detection circuit 43-3, and so forth, and accesses the main memory 5 and the common database 6 and so forth through the communication service database management unit 4-A. In this case, the common database is an electronic telephone directory in the form of a database which is employed in order to determine information relating to users such as for example dialling numbers, individual user names, group names, job names and so forth.

The basic call processing unit 4B processes calls at the physical level (P level), and processes calls made by dialling number only. In this case, the service module 4-2 acts as a normal switching device and hence performs specified processing. Examples of the basic call processing that is performed by the basic call processing unit 4B include network control, resource management, data management, timer starting and stopping, signal processing, and so forth.

The call management unit 4D supports the following functions. Physical level services are provided by the call management unit in combination with the basic call processing unit, and the call management unit manages the shifts in the statuses of the individual services. In this case, the addition of new software or the modification of existing software to enable the addition of new services or the modification of existing services should be as localized as possible, and application software for the physical level must be independently allocated to the individual

services. Moreover, the provision of one call through control method, which distributes the analysis of the statuses within services to the individual services, and the separation of calling tasks and receiving tasks, in order to flexibly provide a wide variety of services, and the provision of control of services through call distribution which forms services through appropriate combinations of the foregoing, are desirable. The call management and control unit 4D supports a variety of functions which are required for the purpose of call management such as the complete separation of these service modules in the service module 4-2, the enabling of one call through and call distribution, an implementation determination function through the analysis of call status and the analysis of events, a function to control transfers between service modules, and a function to synchronize call out tasks, and so forth.

The following is a description of the operation of the present invention through the flow chart shown in Figure 5 and by reference to the other diagrams.

- (1) When the user (subscriber) makes an outgoing call and the dialling signal thereof is received, the basic call processing unit 4B envisaged by the present invention transfers the signal through the service module to the operation management control unit 4-3.
- (2) The communication service database management unit 4A first identifies in the name dialling identification circuit 43-1 whether or not the signal is a name dialling signal. Then, if the signal is a name dialling signal, the schedule detection circuit 43-3 through the communication service database control unit 4A finds from the common database shown in Figure 1 the user individual number which was dialled by name. The system then retrieves through the individual number so found the schedule management table, and determines whether or not the user of the individual number has registered a schedule. If a schedule is registered, the schedule is retrieved, and the schedule is read from the schedule pointer, the location at that point in time of the user dialled by name is determined, and the telephone number of the terminal at that location is retrieved. In this manner, the basic call processing unit 4B controls the service module 4-2 and calls out to the required location. In this case, if the terminal at that location is in use, the system calls out to the (home?) terminal not the new location. Naturally, if the user dialled by name has not registered a schedule, the individual number (terminal telephone number) retrieved from the common database is used to call out to the home terminal.

- (2)¹ If in (1) the name dialling identification circuit 4A-1¹ identifies the signal received as not being a name dialling signal, the code number identification circuit 4A-2¹ determines whether the signal is a code + dialling signal. If a code number is identified, the following dialling signal shows the individual number in this case, and therefore the system directly retrieves the schedule management table, and determines whether or not the user of the individual number has registered a schedule, and performs processing similar to that in (1) on that basis.
- (3) Then, if the dialling signal received is not a name dialling signal, and is not a code + dialling signal, the signal is identified as a normal dialling signal of the conventional type, and the basic call processing unit 4B (controls?) the service module 4-2 and calls out to the home terminal specified in the dialling signal.

The following is a simplified description of the person-to-person status in (1) and (2) above. In name dialling, the individual number is obtained from the common database, whereby the schedule management table and the schedule are accessed, and if a code number is employed, the schedule management table and the schedule are accessed directly through the individual number, and hence for the sake of simplicity, these cases are described by reference to an example in which a code + dialling signal are called.

In Figure 6, when user A calls out by employing a code + dialling from his home terminal to user B, the outgoing call is first processed at the physical level, and similarly, incoming call processing is performed through the reception of the outgoing call at the physical level. In this case, the presence of a code indicates that individual schedule management is to be performed, and the system determines whether or not a schedule is registered, and the schedule shows that, at this time of day, user B is not present at his home terminal B but that user B is present at terminal C belonging to user C, and therefore, on the basis of this data, the incoming call task control at the P level performs transfer processing to transfer the call to user B to terminal C belonging to user C. In this manner, user A is able to call user B at the new location without user A being in any way aware that the call has been transferred.

For incoming calls, subscriber classes and so forth may be employed in order to determine whether or not the party being called is a registered subscriber who is a user able to register a schedule as envisaged by the present invention, and if this service is registered for that subscriber class, the system references the common database, and is able to provide a transfer service

¹ Number as Japanese text - Translator

according to the time of day, as described in the foregoing. Naturally, this service may be registered for all subscribers, and in that event, the check of the subscriber class and so forth is unnecessary when an incoming call is received, and the system can access the data files directly.

- 5 Moreover, while the foregoing explanation relates to private branch exchange systems, the present invention is of course not restricted thereto.

Effects of the present invention

- 10 By means of the present invention, a schedule which records the subscriber schedule for different times of day may be created, whereby, when incoming calls are received for the subscriber, the transfer of incoming calls to the new locations of the subscriber may be performed, and thus a very convenient service may be provided.

15 4. Simplified Description of the Diagrams

- Figure 1 is an explanatory diagram of the common database, the schedule management table, the schedule, and their connections; Figure 2 is a system outline diagram of the present invention; Figure 3 is a detailed plan of the central control unit of the system; Figure 4 is a detailed plan of the communication service database management unit; Figure 5 is a diagram which explains the operation of the present invention, and Figure 6 is a diagram which explains the individual schedule management service.

In the diagrams, 1-0 to 1-n are telephones, 2 is an exchange network, 3-0 to 3-n are trunk lines, 4 is the central control unit, 5 is the main memory, and 6 is the common database.

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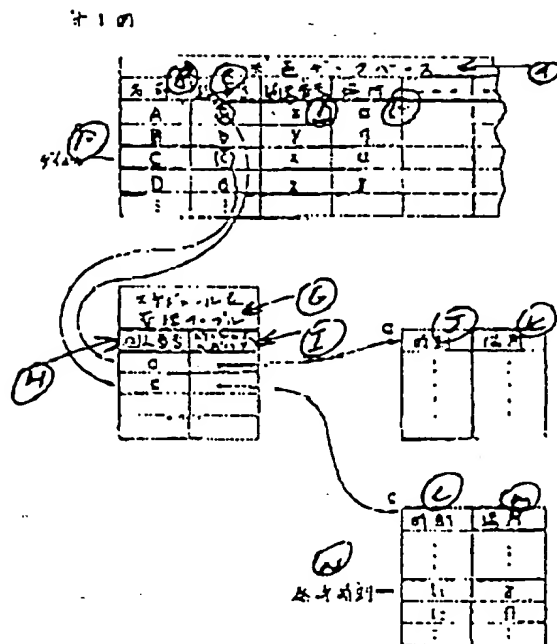


Figure 1

A: (illegible) database; B: Name; C: Individual number; D: Code?; E: Location; F: Dialling; G: Schedule management table; H: Individual number; I: Schedule (illegible); J: Time; K: Location; L: Time; M: Location; N: Call in time

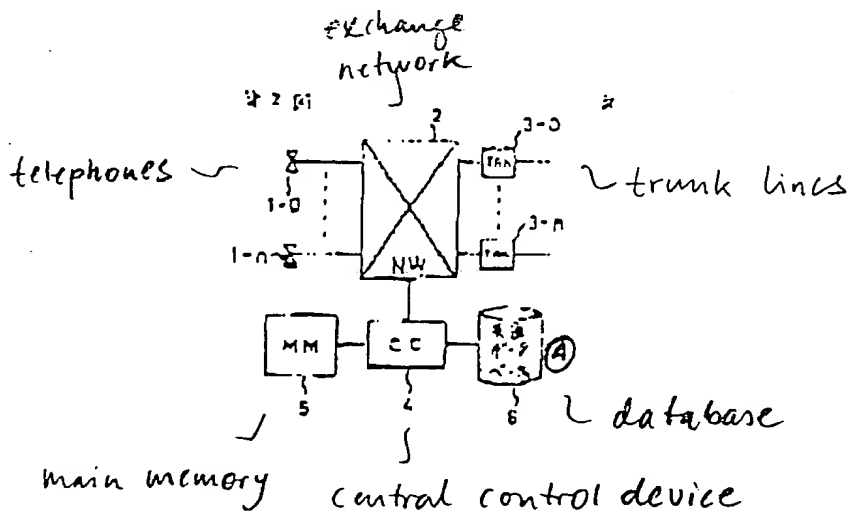


Figure 2

A: Communications database

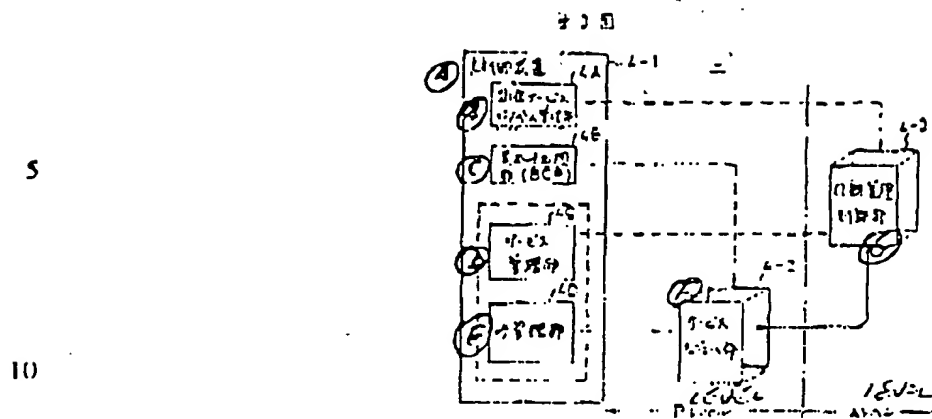


Figure 3

A: Main memory; B: Communication service database management unit; C: Basic call processing (BCP); D: Service management unit; E: (illegible) management unit; F: Service module; G: Operation management control unit

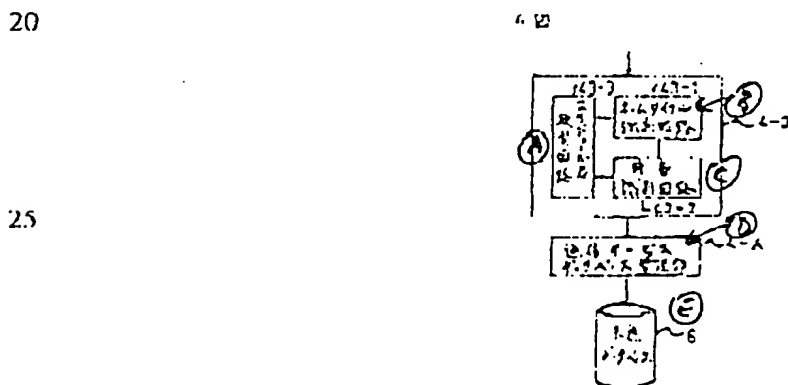


Figure 4

A: Schedule detection circuit; B: Dialling identification circuit; C: Code number identification circuit; D: Communication database management unit; E: Common database

図 5 (2)

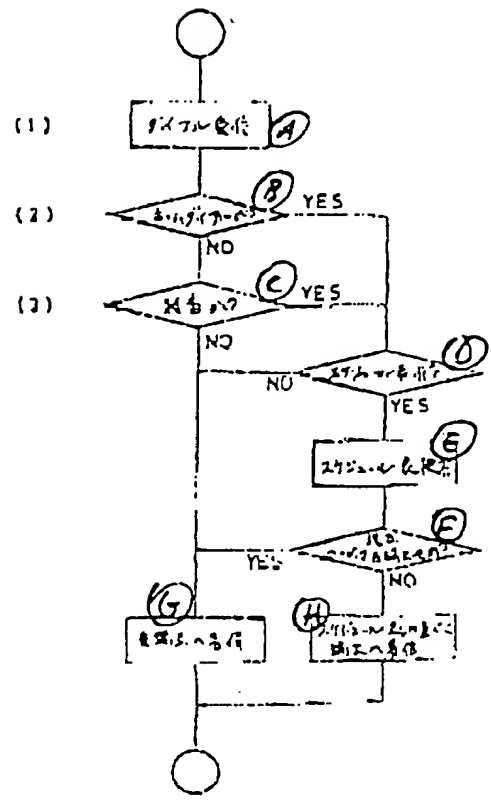


Figure 5

A: Dial signal received; B: Name dialling?; C: Code?; D: Schedule?; E: Retrieve schedule; F: Location: user home terminal?; G: Call to home terminal; H: Call to terminal (illegible) schedule

7 6 ②

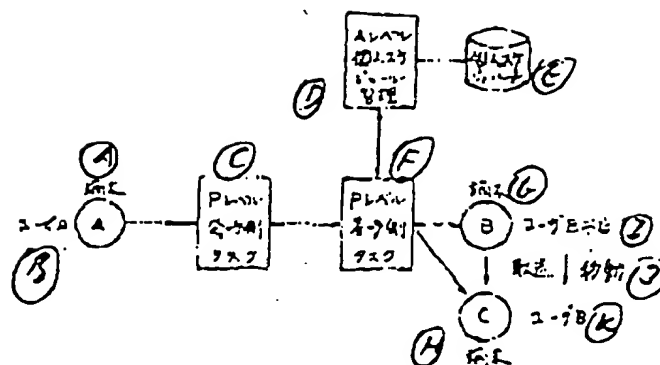


Figure 6

A: Terminal; B: User A; C: P level outgoing call task; D: A level individual schedule management; E: Individual schedule; F: P level incoming call task; G: Terminal; H: Terminal; I: User B absent; J: Transfer Shift; K: User B

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